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AUTHOR Adams, Kay
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ABSTRACT

The qualitative case study approach was used to collect data about the impact of the National Center for Research in Vocational Education's (NCRVE) work on teacher education and competency. Two exemplary sites using a set of performance-based teacher education (PBTE) modules and supporting materials developed by NCRVE were selected for detailed study of impact: Temple University and the University of Central Florida. Major focus of field work was determining the effects of the PBTE modules. Findings indicated PBTE (1) helped vocational teacher education programs survive in a period of retrenchment; (2) increased access to vocational teacher certification, accountability, convenience to teachers, flexibility, teacher competency in some areas, and teacher's self-evaluation and responsibility for learning; (3) shortened time required to certify teachers; and (4) changed teacher's role from classroom lecturer to instructional manager. Conclusions drawn about effects of PBTE curricula included that it has changed aspects of delivery of vocational teacher education, appears more effective and efficient in educating teachers than traditional approaches, is perceived by users as a high quality product, provides impetus to the competency-based vocational education movement, and appears to have long-term impact on improving teachers. (YLB)

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THE IMPACT OF RESEARCH ON PROBLEMS OF NATIONAL SIGNIFICANCE

Kay Adams
National Center for Research
in Vocational Education

Is R&D bringing about significant changes in the fabric of vocational education? What's really different from our investment in voc ed R & D? These questions are ambitious but to fully understand the impact of research on voc ed, we need to go beyond numbers to some of the deeper questions.

In this paper, I will examine some aspects of the deeper impact of research. I will concentrate primarily on the work of the National Center for Research in Vocational Education. During the past 3 years, several impact studies have been conducted to examine the work on nationally significant problems such as increasing sex equity[1], improving evaluation,[2] improving career guidance,[3,4] and improving teacher education.[5]

In examining these problems, we wanted to tell an upbeat story, not a biased story but a real story about aspects of research that had truly made a difference. It became apparent in the early conceptual phases that an experimental approach focusing on quantitative data would produce disappointing results. Like many research organizations, the National Center works on complex problems which are not easy to change. Most of the work is not focused on classrooms but on the broader networks and systems of vocational education. When effects do occur from research, they are often subtle, highly individualized in different settings, and evolving in an interactive pattern with many other forces.

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Qualitative Methodology

We decided to turn to an alternative approach that is receiving increased attention in educational circles, namely qualitative or naturalistic methodology. The purpose of this approach is to discover the effects of a program through observing it in action in its natural context. The variables of interest are not preselected but emerge as the program is observed. The effect of a program is not reduced to a singular phenomenon, but rather a pluralistic view, representing multiple realities of the program is taken. Qualitative methodology provides a rich description of a program from the perspectives of the different people involved.

The technique used to collect data about the impact of several National Center projects was qualitative case studies. Projects were studied on site so that their effects could be fully understood. An interview schedule was developed which outlined major topics and sub-topics rather than a set of specific questions. Data was collected through in-depth open ended interviews with a variety of project staff and participants. Purposeful samples of extreme cases (advocates/adversaries; deeply involved/superficially involved), typical cases, and key informants were used. Interviews were supplemented by observation of the program and examination of various records. Triangulation, a procedure for checking patterns of similarity or difference across different data sources, was used to test the accuracy of the information collected. A site visit team comprised of three evaluators, one member from outside the National Center, was used to enhance credibility and facilitate triangulation among multiple observers.

During the interviews, questions were asked in ways that allowed respondents to direct the interview to the issues that were most important

to them, such as "What have you learned from this program?" and "What do you do now that you didn't do before the program began?" Respondents also were encouraged to describe the program in their own words through questions, such as "Take me through a typical day in ....." or "What would I see in terms of a participant's progress in .....". Emphasis was placed on soliciting direct quotes and recording them verbatim. Quotes allowed many subtle findings to be maintained and were quite insightful during analysis.

The Impact of the National Center's Work on Teacher Eucation

Rather than superficially discussing impact on a number of problems, I will focus on the problem of teacher education and competency. After examining the impact on this problem, some of the broader issues related to impact on problems of national significance will be discussed. By far the most widespread and deepest impact of the National Center can be found in the area of teacher education. After 10 years of work and approximately two million dollars of federal support, the National Center has played a key role in the growth of performance-based teacher education (PBTE). Beginning with research on teacher competencies, the National Center developed a set of 100 PBTE* modules and supporting materials,[6] tested these materials, and conducted a wide range of training activities. Two exemplary sites using PBTE were selected for detailed study of impact: Temple University in Philadelphia, Pennsylvania and the University of Central Florida in Orlando, Florida. Additional data were collected through telephone interviews and surveys of 71 different teacher education programs.

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*The term PBTE is used in this study to refer to the National Center's PBTE curriculum rather than to the general concept of PBTE.

Effects of PBTE

Determining the effects of the PBTE modules was the major focus of the field work. In interviews questions were asked about the specific effects and consequences of using the modules, as well as the more general effects of performance-based teacher education programs. This section reviews the findings on effects.

1. Helped vocational teacher education programs survive in a period of retrenchment. It is clear from a number of interviews that when the PBTE program and modules were introduced, a potential for a serious decline of vocational teacher education was present at one of the universities studied. Moreover the changing funding emphasis at the state level, changing demands of vocational schools and teachers in those schools, and possible university retrenchment combined to pose a serious threat to the continuation of vocational teacher education. The development of a PBTE program--with its field emphasis, utilization of professionally developed modules, and pattern of differentiated staffing--made it possible to receive state funds for program development and to maintain student participation in the program in a period of decline.

2. Increased access to vocational teacher certification. Teacher education programs which have adopted PBTE are now able to serve a larger geographic area with small groups of teachers wherever they happen to be. Individualized instruction can be developed through the modules wherever training is needed. The chairman of one department explained this change as follows:

> Previously we were having the problem of delivering courses. That's the main thing this new program has done. We can deliver the program at any time right where the student needs and wants it. There's no question in my mind that the big thing is delivering the right instruction to the right people at the right time.

3. Shortened the time required to certify teachers. In one institution, faculty, staff, and students felt there has been a substantial reduction in the time it takes to obtain vocational certification. Before the introduction of performance-based teacher education and PBTE modules, it often took students three years to complete the program for certification; now most students complete the program in one and a half years. As one director put it:

> One of the good things about the program is its productivity, the ability to move people through the program, complete the modules, and move on...The research evidence says that a classroom approach and our approach produce basically the same results in teachers, but our approach takes considerably less time. I call that a major improvement.

4. Increased accountability. The administration and faculty at the university believe that the total impact of the new program is to make the university more accountable. Through the introduction of PBTE modules, the curriculum has been standardized and made explicit so that the content of vocational teacher education is no longer subject to the uncertainties of the interests and orientation of which ever professor happens to be teaching a particular course. One university administrator said:

> Our program could not exist without the modules...the materials have been proven. That's one of the real strengths of these modules. When you get through them, you can do what they've taken you through...it's a more accountable way of operating. There are not many programs that know what their students can do when they're done. We do know. We've looked at it. We know our products--what they can do.

5. Changed teacher educators role from a classroom lecturer to instructional manager. While teacher educators have had a major impact on the implementation of the program, they have also been affected by the program. Increased contact with the community and more personalized and

individualized contact with teachers in the program are two changes in role responsibility. Less time is spent in lecture and formal instruction. Faculty autonomy in determining course content has been diminished and replaced with an increased emphasis on managing instruction. Most teacher educators view this change positively as summarized by a program director:

> The reaction of teacher educators has been extremely positive. They didn't like lecturing much. They feel they're more effective now. There is no feeling of loss in not determining the full content of the curriculum. I think they're more satisfied.

6. Increased convenience to teachers. In interviews with teachers, this theme of convenience consistently emerged. An occupational health instructor said:

> I take the modules at a slow pace because I have too many hats to wear already. The modules have permitted me to do it when I have time instead of fitting my schedule to a lot of class time. I work at my own pace.

Another student said:

> I think being able to choose my own sequence and own schedule was the most important thing to me. This really beats the hell out of college lecturers reading to us out of a textbook.

7. Increased flexibility. Because the program is individualized, inservice teachers can begin the program whenever they are hired. Teachers hired in the middle of the year, or even in the middle of a quarter, can sign up immediately. As a director of the program put it:

> We can now give teachers help immediately, whenever they are hired. We can only do that with modules in an individualized program.

8. Increased teacher competency in some areas of instruction. A major focus of the interviews was on the long term effects of participating in the program. The issue here is important: having demonstrated a

competency at a given point in time, does that competency carry over and manifest itself in actual teaching situations or is the competency lost or ignored once the requirements for certification have been fulfilled: We put this question to faculty, administrators and teachers who had completed the program. Many of the teachers reported they used what they had learned without having to think about it. There were, however, some common elements that were noted as having long term carry-over effects in teaching:

- An increased consciousness about objectives--the importance of having objectives and making them explicit to students
- More polished skills in developing lesson plans and organizing content into units of instruction
- Increased awareness of the importance of using reinforcement techniques in teaching
- Improved skills in individualizing instruction
- Improved skills in evaluating the performance of their students

One teacher interviewed said that her teaching had been substantially affected by her experience in the PBTE program:

> About every module I've taken has been really relevant to my teaching situation. I've been able to develop many things I use from the modules. I now teach in what I call a modified competency-based approach. I use lab handouts, actually mini-modules that I developed myself. I evaluate my students when they're ready. They work at their own pace. The mini-modules work really well. My teaching is completely organized around their independent competency work.

It is clear that the issue of long-term effects is an important one. It is also clear that the data presented here about the long-term effects in teacher competencies is no more than impressionistic. The effects identified here suggest important outcomes that should be studied over time in a comparative framework to fully understand the effects of performance-based teacher education.

9. Increased teacher's self-evaluation and responsibility for learning. A common theme expressed by program staff was the extent to which program participants learned how to be self-evaluative. In order to successfully get through the modules, teachers had to learn how to assess their own work and competencies. That process of self-assessment became internalized and carried over to affect their teaching in the long run.

Related to the theme of self-assessment is the idea of "taking responsibility for one's own learning." A program director expressed the importance of this idea and its effects on the learning process as follows:

> The typical person who comes into PBTE has never learned to take responsibility for his own learning--it takes a while to understand that the modules are related to what they are doing as teachers. Once they understand this and begin to take responsibility for their own learning they can go through the modules because they find they are relevant to what they are doing out there in their classroom.

Weaknesses of PBTE

Although this study focused primarily on users rather than nonusers of PBTE, there was evidence of some opposition to the performance-based education and performance-based teacher education movements in the institutions studied. The opposition was typically expressed as opposition toward the concept of performance-based education which is viewed as overly mechanized and simplistic, rather than toward the PBTE modules. Some direct quotes about perceived weaknesses of PBTE are presented below to preserve the flavor of the interviews.

1. Too general. "Specificity and individuality have been sacrificed in an attempt to be generalizeable to a diverse user population. There's no way a single document can be relevant to all users nor do everything for all levels." (Teacher educator)

2. Reduce individuality. "Education is both an art and a science. PBTE is individualized but it doesn't permit individuality; it actually reduces the latter." (Teacher educator)

3. Limited emphasis on affective domain. "The modules have a tendency to develop 'technicians' rather than professionals. A module explains how to develop a lesson plan rather than describing how a lesson plan fits into a total education program. The inductive, thoughtful, and interactive approach to learning is diminished. Developing an educational philosophy is more a dialectice process than a process of programmed instruction through modules." (Teacher educator)

4. Require highly motivated students. "PBTE requires students to be relatively highly motivated and self-directed. Some students fall through the cracks and don't really get the attention that they need to complete the program." (Teacher educator)

5. Potential for misuse. "Some faculty see the modules as an easy way out of teaching." (Teacher educator)

"Now I just do the assignment. I start at the back of the book and then skim the module. No one's going to quiz you to see what you know." (Teacher)

"Modules are misused by administrators who think modules are 'band-aids' to slap onto a teaching problem." (Teacher educator)

Conclusions

Although there is some evidence of opposition to the competency-based education and PBTE movements in some of the institutions studied, the following conclusions can be drawn about the effects of the PBTE curricula: (1) most users express a strong feeling of ownership of their PBTE programs; (2) it has changed many aspects of the delivery of vocational teacher education; (3) it appears to be more effective and efficient in educating teachers than traditional approaches; (4) it is perceived by users as a high quality product; (5) it is providing impetus to the movement toward competency-based instruction for all vocational education students; and (6) it appears to be having a long-term impact on improving vocational education teachers.

Factors That Enhance Impact of Research

In this paper, teacher education was portrayed as an example of a nationally significant problem that was addressed by substantial R & D effort. In comparing the findings from this study with other studies of impact on nationally significant problems, several factors that enhance the impact of R & D emerged as important. At first glance these factors may seem obvious. But since they are frequently absent in R & D efforts, it is important to take a second glance. No systematic attempt to examine the relative importance of these factors has been undertaken. But based on experiences with and reflections on the products, the following critical factors for success of an R & D effort are offered. A successful R & D effort would:

1. Meet a truly critical need - one that appears to be increasing, one that is not being well met by other products in use or under development. and one that it makes sense to meet through an R & D effort.

2. Have a clearly defined target audience which is involved in developing, testing, and using the product as early and as much as possible.

3. Have a committed and highly persistent project staff who care about their work and become personal advocates for its use in the field.

4. Use considerable and varied dissemination techniques including workshops, technical assistance, deploying former project staff to start field efforts, establishing networks and consortiums of users, and using successful users/sites to train others.

5. Provide a product that is multifaceted and flexible so that it has appeal to different users in varied settings. The product should allow users to adapt the product to their own settings. This feature facilitates ownership which, in turn, facilitates continued use of the product.

6. Provide a high quality, carefully researched, fully tested, and well written product.

7. Provide a product that is used with or has direct impact on students. (This refers to students at all levels of education.) Since students are the main business of education, this feature helps assure that the product will be used.

8. Provide professionally printed products to insure there will be sufficient quantities readily available to users when needed.

9. Have products which are as short as possible or divided into short modules. Products should contain executive summaries, indexes, detailed table of contents and other tools to make their use convenient.

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